

Abstract of the Disclosure

of 420, say

An impurity precipitation region is formed by introducing an impurity, e.g., oxygen, into a silicon substrate or a silicon layer and thermally treating it, and performing high selectivity anisotropic etching with the precipitation region used as a micro mask. Thus, a cone (conic body or truncated conic body having an annular leading end) having a very sharp and slender needle shape with an aspect ratio of about 10 and a diameter of 5 about 10 nm to 30 nm in the vicinity of its leading end is obtained with the micro mask used as the top. By forming an insulation layer and a drive electrode such as a gate electrode around the cone, the cone can be used for a field emission device, a single electron transistor, a memory device, a high frequency switching device, a probe of a scanning type 10 15 microscope or the like.

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